

ICT Integration Through Multimedia Instruction: Impact on Reading Comprehension and Engagement of Grade 5 Pupils in Region 6, Guyana

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Abstract: This study examined the impact of ICT-integrated multimedia instruction on the reading comprehension and engagement of Grade 5 pupils in Region 6, Guyana. The study addresses the need for evidence-based literacy instruction that integrates reading pedagogy with appropriate information and communication technology (ICT) resources. A mixed methods design was used with 172 Grade 5 pupils. Quantitative data were collected through pre-test and post-test reading comprehension scores, engagement ratings, and pupil questionnaire responses, while qualitative data were gathered through classroom observations, pupil comments, and teacher reflection notes. The intervention used projected texts, teacher-created digital slides, images, audio narration, short instructional videos, vocabulary visuals, graphic organizers, and interactive comprehension activities. The study was guided by Mayer's Cognitive Theory of Multimedia Learning and the Technological Pedagogical Content Knowledge (TPACK) framework. Results showed that pupils' mean reading comprehension score increased from 52.67% to 70.53% after the intervention, a gain of 17.86 percentage points. The paired-samples t-test showed a statistically significant difference between pre-test and post-test scores, $t(171) = 38.17$, $p < .001$. Engagement also improved from $M = 2.23$ to $M = 3.41$, and engagement was positively associated with reading-comprehension gain, $r = .71$, $p < .001$. The findings suggest that ICT-integrated multimedia instruction can strengthen vocabulary understanding, attention, participation, confidence, and comprehension when it is carefully aligned with curriculum goals and teacher-guided reading strategies.

Keywords: ICT Integration, Multimedia Instruction, Reading Comprehension, Pupil Engagement, Grade 5 Pupils, Educational Technology, Guyana, Primary Education.

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I. INTRODUCTION

Reading comprehension is a foundational literacy competency because it allows pupils to construct meaning from text, interpret ideas, draw inferences, connect new information to prior knowledge, and communicate understanding. At the Grade 5 level, pupils are expected to move beyond word recognition and oral fluency toward deeper comprehension, including identifying main ideas, explaining details, interpreting vocabulary, sequencing events, drawing conclusions, and evaluating messages in texts.

Information and communication technology (ICT) has become increasingly relevant to literacy instruction because pupils encounter information through printed, visual, audio, and digital modes. In classroom practice, ICT integration refers to the purposeful use of digital tools and media to

support curriculum delivery, assessment, learner participation, and instructional differentiation. For reading comprehension, ICT may include projected texts, digital slides, images, audio narration, instructional videos, interactive quizzes, electronic dictionaries, graphic organizers, tablets, laptops, speakers, and offline multimedia content.

In Guyana, primary schools are expected to prepare pupils for both print literacy and digital literacy. Traditional reading instruction remains important; however, some pupils may need multiple forms of support to understand unfamiliar vocabulary, build background knowledge, grasp text structure, and infer meaning. ICT-integrated multimedia instruction can support reading by combining words, images, sound, movement, and guided interaction. When these resources are aligned with clear learning objectives, pupils

can receive visual and auditory support while still engaging in reading, questioning, discussion, and written response.

The present study, therefore, examined ICT integration through multimedia-supported reading lessons. Multimedia instruction was not treated as entertainment or as a replacement for the teacher. Instead, it was conceptualized as a planned pedagogical approach in which ICT resources were used to introduce texts, explain vocabulary, model fluent reading, build background knowledge, organize ideas, and strengthen comprehension. The study was grounded in Mayer's Cognitive Theory of Multimedia Learning and the TPACK framework, both of which emphasize that technology improves learning only when it is meaningfully connected to content and pedagogy.

➤ *Statement of the Problem*

Reading comprehension remains a concern in many primary classrooms. Pupils may pronounce words correctly but still struggle to understand meaning, identify main ideas, interpret vocabulary in context, answer inferential questions, summarize passages, and explain a text's message. These difficulties can affect confidence, engagement, and performance across other curriculum areas.

At the Grade 5 level in Region 6, pupils are expected to develop stronger comprehension skills in preparation for higher academic demands. However, when reading lessons rely mainly on printed passages, oral reading, teacher explanation, and written questions, some pupils may become passive or disengaged. This problem is especially important where learners benefit from visual, auditory, and interactive support.

The problem addressed in this study is that ICT resources are often available in schools, yet they may not be fully integrated into literacy instruction in a systematic, curriculum-aligned, and pedagogically meaningful way. Technology may be used occasionally for display or entertainment rather than as a structured instructional tool for improving comprehension. Therefore, this study examined whether ICT-integrated multimedia instruction could improve Grade 5 pupils' reading comprehension and engagement.

➤ *Purpose and Objectives of the Study*

The purpose of this study was to examine the impact of ICT-integrated multimedia instruction on the reading comprehension and engagement of Grade 5 pupils in Region 6, Guyana. The specific objectives were to:

- Assess pupils' reading comprehension performance before exposure to ICT-integrated multimedia instruction;
- Implement ICT-integrated multimedia-supported reading lessons among Grade 5 pupils;
- Compare pupils' reading comprehension performance before and after ICT-integrated multimedia instruction;
- Examine pupils' engagement during ICT-supported multimedia reading lessons;

- Explore pupils' perceptions of ICT integration in reading comprehension lessons, and identify the benefits and challenges associated with using ICT-integrated multimedia instruction in Grade 5 reading lessons.

➤ *Research Hypotheses*

• *Hypothesis 1*

- ✓ H₀₁: There is no statistically significant difference between the pre-test and post-test reading comprehension scores of Grade 5 pupils exposed to ICT-integrated multimedia instruction.
- ✓ H₁₁: There is a statistically significant difference between the pre-test and post-test reading comprehension scores of Grade 5 pupils exposed to ICT-integrated multimedia instruction.

• *Hypothesis 2*

- ✓ H₀₂: ICT-integrated multimedia instruction has no statistically significant effect on the reading comprehension performance of Grade 5 pupils in Region 6, Guyana.
- ✓ H₁₂: ICT-integrated multimedia instruction has a statistically significant effect on the reading comprehension performance of Grade 5 pupils in Region 6, Guyana.

• *Hypothesis 3*

- ✓ H₀₃: There is no statistically significant relationship between ICT-integrated multimedia instruction and pupil engagement during reading comprehension lessons.
- ✓ H₁₃: There is a statistically significant relationship between ICT-integrated multimedia instruction and pupil engagement during reading comprehension lessons.

II. LITERATURE REVIEW

➤ *ICT Integration in Primary Education*

ICT integration in primary education involves the intentional use of digital tools to improve teaching and learning rather than the simple presence of devices in classrooms. The UNESCO ICT Competency Framework for Teachers emphasizes that teachers need knowledge, skills, and professional judgment to use ICT for curriculum, pedagogy, assessment, organization, and learner support (UNESCO, 2018). Similarly, OECD (2025) argues that digital tools can influence learning and motivation across primary and secondary education, but their effectiveness depends on purpose, design, implementation conditions, and teacher mediation. This means that ICT integration must be evaluated in relation to instructional quality, not only access to devices.

In literacy classrooms, ICT integration may support vocabulary development, background knowledge, fluency, discussion, collaboration, formative assessment, and differentiated learning. However, evidence also shows that technology is not automatically beneficial. Fälth et al. (2024)

found that teachers' use and perceptions of digital technology are shaped by accessibility, learner needs, participation, and professional confidence. Therefore, ICT-supported reading instruction must be planned around the specific comprehension skills pupils are expected to develop.

➤ *Reading Comprehension and Primary Literacy Development*

Reading comprehension refers to constructing meaning from text through vocabulary knowledge, prior knowledge, language comprehension, fluency, inference, monitoring, and critical thinking. At the primary level, comprehension becomes increasingly important because pupils move from learning to read toward reading to learn. The National Reading Panel (2000) identified vocabulary, fluency, and comprehension strategy instruction as important components of reading development, while Duke and Cartwright (2021) emphasized that reading comprehension depends on a broad network of language, cognitive, knowledge-based, and strategic processes.

For Grade 5 pupils, comprehension instruction should support literal understanding, inferential thinking, vocabulary in context, sequencing, main idea identification, summarizing, and evaluative response. Multimedia instruction is relevant because many comprehension difficulties are connected to limited background knowledge, weak vocabulary, and a lack of motivation. When visuals, audio support, and interactive prompts are well designed, they can help pupils connect words to meaning and actively process what they read.

➤ *Multimedia Instruction and Cognitive Processing*

Mayer's Cognitive Theory of Multimedia Learning provides a major theoretical basis for ICT-integrated reading instruction. The theory states that learners process information through verbal and visual channels and that meaningful learning occurs when learners select relevant information, organize it into coherent mental models, and integrate it with prior knowledge (Mayer, 2009, 2021). More recent discussion by Mayer (2024) continues to emphasize that multimedia learning is most effective when design principles reduce unnecessary cognitive load and support active processing.

For reading comprehension, this theory suggests that pupils may understand texts better when key ideas are supported by relevant visuals, spoken explanation, highlighted vocabulary, and organized representations. However, multimedia materials can also overload pupils if slides are crowded, videos are unrelated, or too many media elements compete for attention. Therefore, the present study used short videos, focused visuals, audio narration, vocabulary examples, and graphic organizers that were aligned with the reading objectives.

➤ *TPACK and Teacher-Guided ICT Integration*

The TPACK framework posits that effective technology integration requires teachers to combine technological, pedagogical, and content knowledge (Mishra & Koehler, 2006; Koehler & Mishra, 2009). In this study, the content was

Grade 5 reading comprehension, the pedagogy included guided reading, questioning, vocabulary instruction, and group discussion, and the technology included projected text, slides, visuals, videos, audio narration, and graphic organizers. The framework is important because it prevents technology from being treated as a separate add-on. Instead, ICT must be selected because it helps pupils understand a particular reading skill or text.

Ertmer (1999) also noted that technology integration can be affected by first-order barriers such as equipment, access, time, and technical support, as well as second-order barriers such as teacher beliefs, confidence, and pedagogical readiness. These issues are relevant to Guyanese primary classrooms because ICT integration may be limited by internet access, power interruptions, device availability, and limited professional development. This study, therefore, examined both the benefits and the practical challenges of using ICT in reading lessons.

➤ *Digital Technologies, Reading Comprehension, and Literacy Outcomes*

A growing body of research suggests that digital and multimedia tools can support reading comprehension when they are used strategically. Abdul Samat and Abdul Aziz (2020) reported that multimedia learning enhanced reading comprehension among indigenous pupils, showing that visual and audio support can help learners understand reading texts. Chen (2023) found that interactive multimodal learning increased students' motivation and comprehension, suggesting that multimodal environments can support both cognitive and affective dimensions of learning.

Recent systematic reviews strengthen this argument and emphasize the importance of implementation quality. Murphy and Arciuli (2024) reviewed digital reading comprehension instruction for school-aged children learning English as an additional language and highlighted the potential of technology-supported comprehension instruction for diverse learners. Liu et al. (2024) reviewed digital technologies for young children's language and literacy skills and found that digital tools have been used to support print knowledge, vocabulary, phonological awareness, narrative skills, and other literacy outcomes. These reviews support the view that ICT can be useful for literacy development when resources are age-appropriate and teacher-mediated.

At the same time, digital reading must be carefully designed. Peras et al. (2023) reviewed research on digital versus paper reading and showed that mode of reading can matter, particularly when comprehension requires sustained attention. This is important because ICT-integrated instruction should not remove printed reading practice. Instead, it should combine digital support with close reading, oral reading, questioning, discussion, and written response. In the present study, ICT tools were used to scaffold comprehension rather than replace reading.

➤ *ICT Integration and Vocabulary Development*

Vocabulary knowledge is a strong foundation for comprehension because pupils cannot fully understand a

passage if they do not know key words and phrases. Multimedia instruction can support vocabulary by allowing pupils to see a picture, hear a pronunciation, watch a short contextual clip, and use the word in a sentence. Liu et al. (2024) noted that digital technologies have been used to support early vocabulary development, especially when interactive features and adult mediation are present. In Grade 5 reading lessons, vocabulary visuals and audio support can help pupils connect new words to concrete meanings and use them in discussions and written responses.

➤ *ICT Integration and Pupil Engagement*

Engagement includes attention, participation, interest, confidence, task completion, questioning, and willingness to take part in learning. ICT-supported lessons may increase engagement by providing multiple entry points into the reading passage. Pupils who may be reluctant to read aloud may still participate by interpreting an image, responding to a video prompt, completing a digital or paper graphic organizer, or discussing vocabulary with peers. OECD (2025) identifies motivation and engagement as important considerations when evaluating digital tools, while Chen (2023) also links interactive multimodal learning to learner motivation.

Engagement, however, must be productive rather than merely entertaining. Multimedia resources should direct attention to the reading objective rather than distract pupils from the text. Therefore, the present intervention used short, relevant multimedia materials, teacher questioning, group discussion, and comprehension tasks to keep pupils focused on reading outcomes.

➤ *Gaps in the Literature and Contribution of the Present Study*

Although international research supports the use of multimedia and digital tools in literacy instruction, there remains a need for more context-specific evidence from Caribbean and Guyanese primary classrooms. Many studies are conducted in contexts with different levels of device access, teacher training, internet availability, and curriculum expectations. This study contributes to the literature by focusing on Grade 5 pupils in Region 6, Guyana, and examining both reading comprehension and engagement using a mixed-methods approach. The study also contributes practical evidence on how teacher-guided ICT integration can be used in ordinary reading lessons with locally relevant constraints.

➤ *Theoretical and Conceptual Framework*

This study was guided by Mayer's Cognitive Theory of Multimedia Learning and the TPACK framework. Mayer's theory explains how pupils process verbal and visual information, while TPACK explains how teachers combine technology, pedagogy, and content. The independent variable was ICT-integrated multimedia instruction, which included projected text, digital slides, images, videos, audio narration, vocabulary visuals, graphic organizers, and interactive tasks. The dependent variables were reading comprehension and pupil engagement. Reading comprehension was measured through literal comprehension, inferential comprehension,

vocabulary understanding, sequencing, summarizing, main idea identification, and evaluative response. Pupil engagement was examined through attention, participation, response to questions, group interaction, task completion, interest, confidence, and willingness to read.

III. METHODOLOGY

➤ *Research Design*

The study utilized a mixed-methods research design. The quantitative component involved pre-test and post-test reading comprehension scores, engagement ratings, and questionnaire responses. The qualitative component involved classroom observations, pupil comments, and teacher reflection notes. The mixed-methods approach was appropriate because test scores indicated whether pupils improved, while qualitative data explained how pupils experienced the ICT-integrated lessons.

➤ *Population, Sample, and Sampling Procedure*

The population consisted of Grade 5 pupils from schools in Region 6, Guyana. The sample comprised 172 Grade 5 pupils from selected schools. A purposive sampling technique was used because the study focused specifically on Grade 5 pupils who participated in the ICT-integrated multimedia reading intervention.

➤ *Research Instruments*

The instruments included a reading comprehension pre-test and post-test, a pupil engagement observation checklist, a pupil questionnaire, and teacher reflection notes. The comprehension tests measured literal comprehension, inferential comprehension, vocabulary in context, sequencing, main idea identification, summarizing, and evaluative response. The engagement checklist measured attention, participation, response to questions, task completion, group interaction, confidence, and interest.

➤ *Validity and Reliability*

Content validity was strengthened by having the instruments reviewed by experienced primary teachers and literacy specialists. The instruments were also piloted with a small group of Grade 5 pupils who were not part of the main study. Feedback from the pilot was used to revise unclear wording and improve age appropriateness. Reliability was strengthened through consistent scoring procedures, a common marking guide, and repeated use of the same engagement indicators across lessons.

➤ *ICT-Integrated Intervention Procedure*

The ICT-integrated multimedia intervention was conducted over four to six weeks. Each lesson included: introduction of the passage using a picture, video clip, or short discussion; vocabulary development using visuals, examples, and pronunciation support; guided reading using projected text and printed copies; audio support or teacher modelling of fluent reading; questioning focused on literal, inferential, and evaluative comprehension; pair or group activity using a graphic organizer; short written response or comprehension quiz; and reflection on the lesson.

➤ *Data Analysis*

Quantitative data were analyzed using descriptive and inferential statistics. Means, standard deviations, frequencies, and percentages were used to summarize comprehension and engagement data. A paired-samples t-test was used to determine whether there was a statistically significant difference between pre-test and post-test scores. Correlation analysis was used to examine the relationship between engagement and reading-comprehension gain. Qualitative data were analyzed thematically by identifying repeated patterns in observations, pupil responses, and teacher reflection notes.

➤ *Ethical Considerations*

Permission was obtained from the relevant school authorities before data collection. Pupils were informed about the purpose of the study using age-appropriate language.

Participation was treated respectfully, and pupil identities were protected. No pupil names were used in reporting the findings. Data were used only for academic and research purposes.

IV. RESULTS

➤ *Hypothesis 1: Difference Between Pre-Test and Post-Test Reading Comprehension Scores*

Hypothesis 1 examined whether there was a statistically significant difference between the pre-test and post-test reading comprehension scores of Grade 5 pupils exposed to ICT-integrated multimedia instruction. The mean pre-test score was 52.67% (SD = 11.44), while the mean post-test score was 70.53% (SD = 12.91), showing an increase of 17.86 percentage points.

Table 1 Pre-Test and Post-Test Reading Comprehension Scores of Grade 5 Pupils.

Test	N	Mean	Standard Deviation	Minimum	Maximum
Pre-test	172	52.67	11.44	25.00	78.00
Post-test	172	70.53	12.91	41.93	96.00

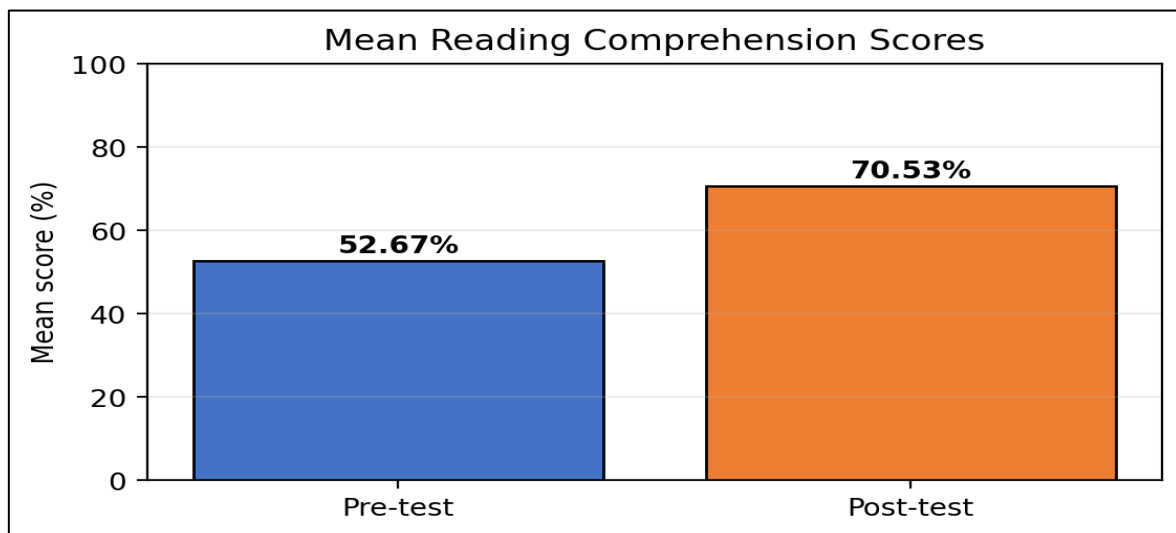


Fig 1 Mean Reading Comprehension Scores before and after ICT-Integrated Multimedia Instruction.

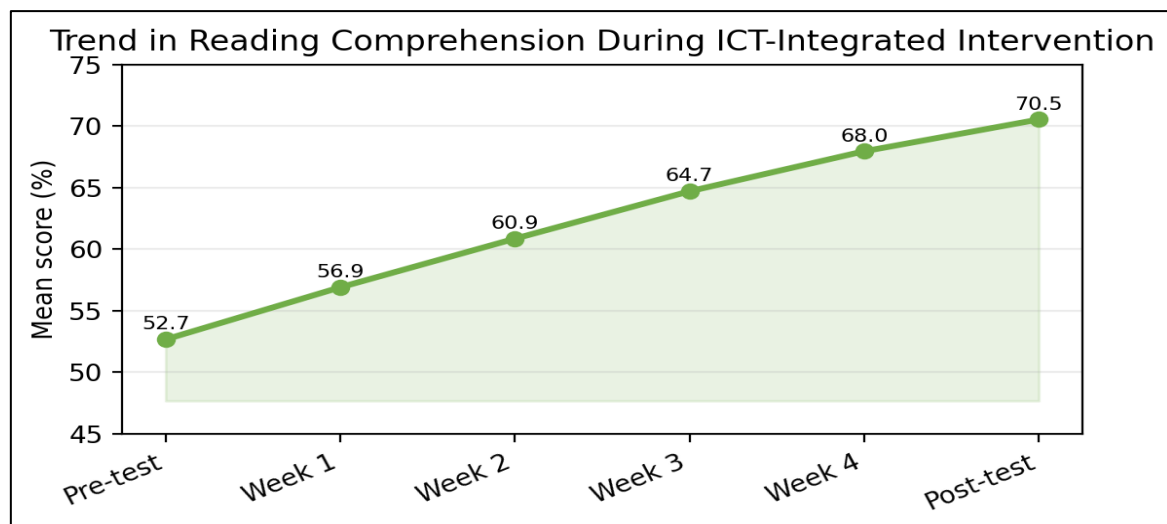


Fig 2 Trend in Reading Comprehension Scores Across the ICT-Integrated Intervention Period.

Table 2 Paired-Samples T-Test Comparing Pre-Test and Post-Test Scores.

Test comparison	Mean difference	t-value	df	p-value	Decision
Pre-test and post-test	17.86	38.17	171	< .001	Reject H01

The paired-samples t-test indicated a statistically significant difference between pre-test and post-test scores, $t(171) = 38.17, p < .001$. Therefore, the null hypothesis for Hypothesis 1 was rejected. Pupils exposed to ICT-integrated multimedia instruction demonstrated higher reading comprehension performance after the intervention.

➤ *Hypothesis 2: Effect of ICT Integration on Reading Comprehension Performance*

Hypothesis 2 examined whether ICT-integrated multimedia instruction had a statistically significant effect on pupils' reading comprehension performance. Pupils improved across all selected comprehension indicators.

Table 3 Reading Comprehension Indicators before and after ICT-Integrated Multimedia Instruction.

Performance Indicator	Before ICT Integration	After ICT Integration	Interpretation
Overall comprehension performance	52.67%	70.53%	Improved by 17.86 percentage points
Literal comprehension	60.40%	78.20%	Improved
Inferential comprehension	47.30%	64.80%	Improved
Vocabulary in context	51.90%	71.60%	Improved
Summarizing and main idea	49.70%	67.90%	Improved

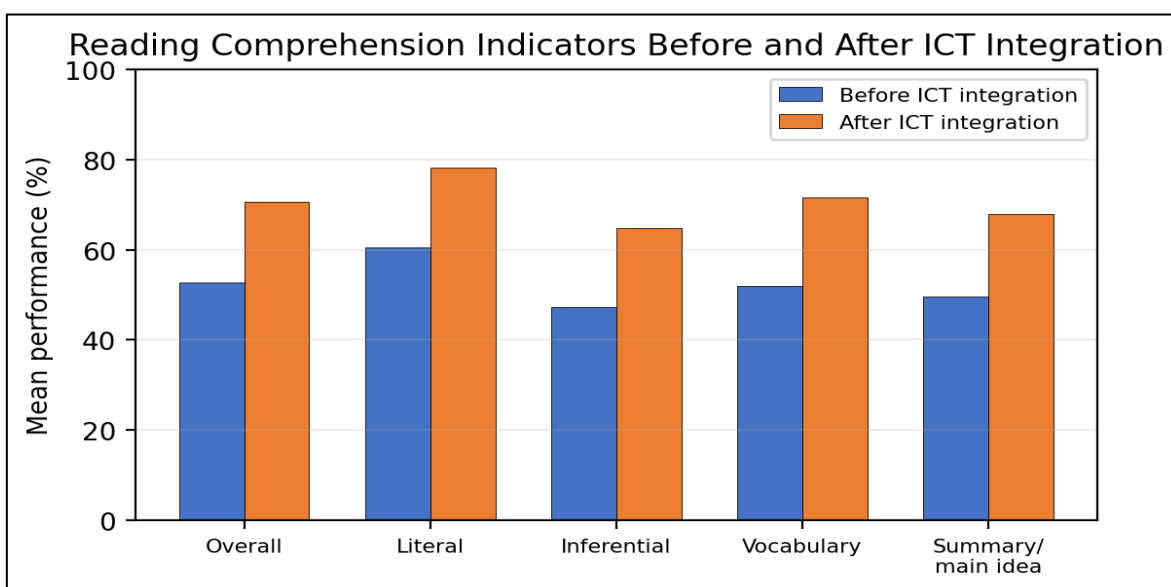


Fig 3 Reading Comprehension Indicators before and after ICT-Integrated Multimedia Instruction.

Based on these results, the null hypothesis for Hypothesis 2 was rejected. ICT-integrated multimedia instruction had a positive effect on pupils' reading comprehension performance.

instruction and pupil engagement during reading comprehension lessons. The engagement data showed high levels of attention, task completion, interest in ICT-supported materials, and participation during multimedia-supported reading lessons.

➤ *Hypothesis 3: Relationship Between ICT-Integrated Multimedia Instruction and Pupil Engagement*

Hypothesis 3 examined whether there was a statistically significant relationship between ICT-integrated multimedia

Table 4 Observed Engagement During ICT-Integrated Multimedia Reading Lessons.

Engagement indicator	Frequently observed	Sometimes observed	Rarely observed
Pupils paid attention during the lesson	139 (80.8%)	28 (16.3%)	5 (2.9%)
Pupils answered comprehension questions	128 (74.4%)	35 (20.3%)	9 (5.2%)
Pupils participated in a group discussion	121 (70.3%)	42 (24.4%)	9 (5.2%)
Pupils completed reading tasks	145 (84.3%)	22 (12.8%)	5 (2.9%)
Pupils showed interest in ICT materials	151 (87.8%)	18 (10.5%)	3 (1.7%)
Pupils asked questions about the passage	97 (56.4%)	55 (32.0%)	20 (11.6%)
Pupils demonstrated confidence during activities	116 (67.4%)	46 (26.7%)	10 (5.8%)

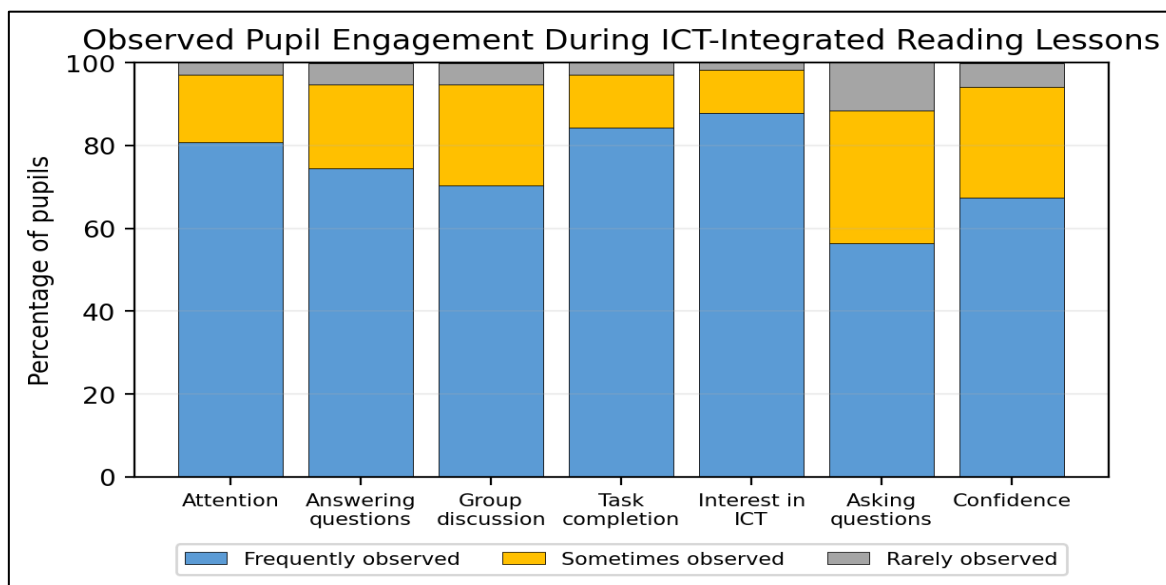


Fig 4 Observed Pupil Engagement During ICT-Integrated Multimedia Reading Lessons.

Table 5 Pupils’ Responses to ICT-Integrated Multimedia Reading Lessons.

Statement	Agree	Not sure	Disagree
Pictures helped me understand the passage.	153 (89.0%)	14 (8.1%)	5 (2.9%)
Videos made the reading lesson more interesting.	149 (86.6%)	16 (9.3%)	7 (4.1%)
Audio helped me follow the passage.	135 (78.5%)	24 (14.0%)	13 (7.6%)
I participated more during ICT-supported lessons.	141 (82.0%)	20 (11.6%)	11 (6.4%)
I would like more reading lessons to use ICT materials.	158 (91.9%)	9 (5.2%)	5 (2.9%)

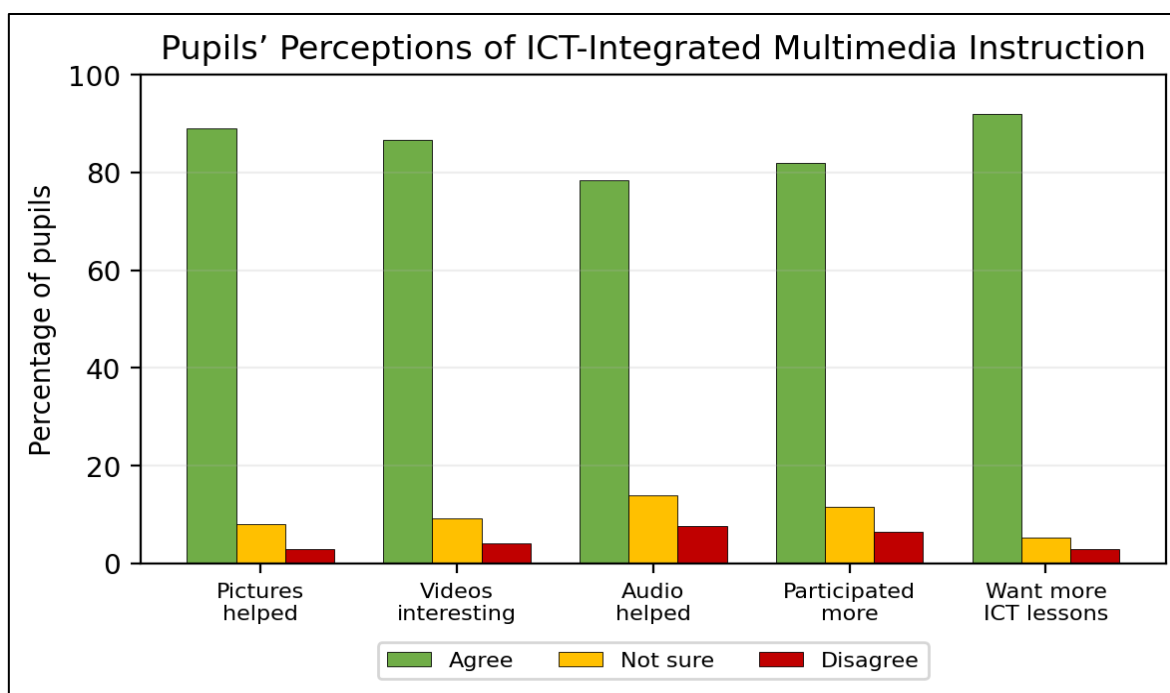


Fig 5 Pupils’ Perceptions of ICT-Integrated Multimedia Instruction.

The engagement score increased from $M = 2.23$ ($SD = 0.55$) before the intervention to $M = 3.41$ ($SD = 0.49$) during ICT-integrated multimedia instruction. The paired-samples t-test showed a statistically significant improvement in engagement, $t(171) = 22.87$, $p < .001$. A positive relationship was also observed between engagement during ICT-integrated instruction and reading-comprehension gain, $r =$

.71, $p < .001$. Therefore, the null hypothesis for Hypothesis 3 was rejected.

➤ *Qualitative Findings*

- Theme 1: Increased attention and interest. Pupils were more attentive when reading lessons included projected

images, short videos, audio narration, and interactive tasks. Visual prompts helped pupils predict content and connect the passage to familiar experiences.

- Theme 2: Improved vocabulary understanding. Pupils indicated that pictures, videos, pronunciation support, and examples helped them understand difficult words. This suggests that ICT integration supported vocabulary by linking unfamiliar words to visual and oral examples.
- Theme 3: Greater participation and confidence. Teacher reflection notes indicated that pupils were more willing to answer questions, participate in group discussions, and complete comprehension tasks during ICT-supported lessons. Some reluctant readers showed greater confidence when audio narration, visuals, and peer interaction supported the reading process.
- Theme 4: Technical and resource challenges. Challenges included limited devices, unstable internet access, power interruptions, insufficient class time, and the need for additional teacher preparation. These findings show that ICT integration requires planning, training, and reliable resources.

V. DISCUSSION

The study found that ICT-integrated multimedia instruction improved Grade 5 pupils' reading comprehension and engagement. The improvement from 52.67% to 70.53% suggests that multimedia-supported lessons helped pupils understand reading passages more effectively. This improvement may be linked to the way visuals, audio narration, videos, projected texts, and graphic organizers provided multiple pathways for understanding.

The findings are consistent with Mayer's Cognitive Theory of Multimedia Learning, which explains that learning is strengthened when verbal and visual information are meaningfully integrated (Mayer, 2009, 2021, 2024). In this study, pupils did not simply watch media; they used multimedia resources to identify vocabulary, follow the passage, answer questions, discuss ideas, and organize responses. This supported active processing rather than passive viewing.

The findings also align with the TPACK framework because the teacher connected reading content, literacy pedagogy, and ICT tools (Mishra & Koehler, 2006; Koehler & Mishra, 2009). The technology was effective because it served specific instructional purposes: introducing background knowledge, clarifying vocabulary, modeling fluent reading, and supporting comprehension tasks. This supports the view that ICT integration works best when the teacher remains central to instructional design.

The positive engagement findings are also important. Pupils showed high levels of attention, task completion, interest in ICT materials, and participation. These results are consistent with studies showing that multimedia and digital tools can support motivation and literacy learning when they are developmentally appropriate and teacher-mediated (Chen, 2023; Liu et al., 2024; OECD, 2025). However, the findings also reinforce the need to avoid technology use that

distracts from comprehension. ICT should support reading instruction, not replace meaningful reading, discussion, and writing.

The study contributes to the Guyanese primary education context by showing how ICT-integrated multimedia instruction can be implemented within Grade 5 reading lessons. It also highlights practical challenges such as device access, power reliability, teacher preparation, and time. These challenges indicate that schools need not only equipment but also professional development and administrative support.

VI. CONCLUSION

This study examined the impact of ICT-integrated multimedia instruction on the reading comprehension and engagement of 172 Grade 5 pupils in Region 6, Guyana. The findings showed that pupils' mean reading comprehension score increased from 52.67% to 70.53% after the intervention, and engagement improved significantly. The study concludes that ICT-integrated multimedia instruction can improve reading comprehension and engagement when carefully planned, curriculum-aligned, and guided by effective pedagogy.

The study further concludes that ICT should not be used as a replacement for the teacher or for printed reading practice. Instead, ICT should enrich reading instruction by providing visual, auditory, and interactive scaffolds that help pupils understand vocabulary, build background knowledge, participate in discussion, and respond to texts.

VII. RECOMMENDATIONS

Grade 5 teachers should integrate ICT-supported multimedia resources into reading comprehension lessons to support vocabulary, fluency, inference, and engagement.

Schools should provide basic ICT resources such as projectors, speakers, laptops, tablets, offline literacy materials, and stable power support.

Teachers should receive professional development in ICT integration, multimedia lesson design, digital literacy pedagogy, and classroom management during ICT-supported lessons.

Multimedia materials should be carefully selected to align with Grade 5 curriculum objectives, pupils' reading levels, and the specific comprehension skill being taught.

Teachers should combine ICT tools with explicit comprehension strategies such as predicting, questioning, clarifying, summarizing, sequencing, inferencing, and vocabulary development.

Further research should use experimental and control groups to provide stronger evidence of the causal effect of ICT-integrated multimedia instruction on reading outcomes.

VIII. LIMITATIONS AND IMPLICATIONS FOR PRACTICE

The study was limited to 172 Grade 5 pupils in Region 6, Guyana; therefore, the findings may not be generalized to all Grade 5 pupils in Guyana. The study may also be affected by differences in pupils' prior reading ability, attendance, access to technology, teacher preparation, and home literacy support. In addition, if a single group was used, improvements in post-test scores may be influenced by factors other than the ICT-integrated intervention.

Despite these limitations, the study has practical implications for literacy instruction. It suggests that teachers should move beyond textbook-only reading lessons and use ICT-integrated multimedia resources to support comprehension. It also suggests that teacher professional development should include practical training in selecting digital resources, designing multimedia-supported reading lessons, managing classroom interaction, and assessing learning.

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